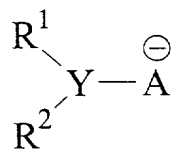


WHAT IS CLAIMED IS:

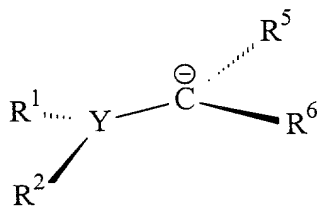
1. A ligand having the formula:



where

- A is CH<sub>2</sub>, CHR<sup>3</sup>, CR<sup>3</sup>R<sup>4</sup>, NR<sup>3</sup>, O, S, or PR<sup>3</sup>;  
 R<sup>1</sup> and R<sup>2</sup> are independently hydrogen, aryl, C<sub>6-15</sub> diarylphospho, C<sub>1-18</sub> alkylthio, C<sub>6-15</sub> arylthio, C<sub>7-15</sub> aralkyl, C<sub>1-10</sub> alkoxy, C<sub>6-14</sub> aryloxy, C<sub>1-10</sub> dialkylamino, or C<sub>6-15</sub> diarylamino; and  
 Y is B, Al, or Ga.

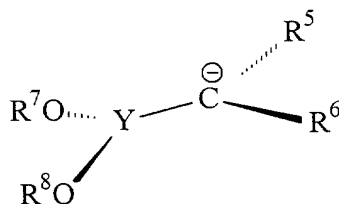
2. The ligand of claim 1 having the formula:



where

- R<sup>5</sup> and R<sup>6</sup> are independently hydrogen, C<sub>1-8</sub> alkyl, C<sub>6-10</sub> aryl, C<sub>7-15</sub> aralkyl, C<sub>1-10</sub> alkoxy, C<sub>6-14</sub> aryloxy, C<sub>1-10</sub> dialkylamino, or C<sub>6-15</sub> diarylamino.

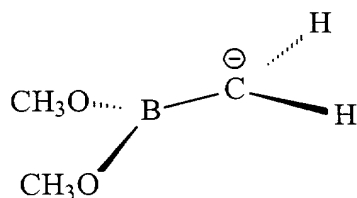
3. The ligand of claim 1 having the formula:



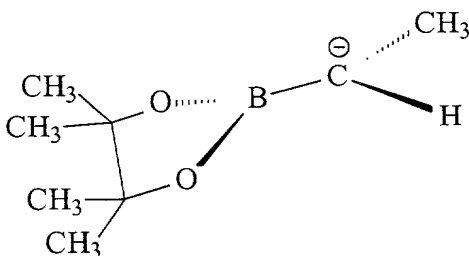
where

$R^7$  and  $R^8$  are independently  $C_{1-8}$  alkyl,  $C_{6-10}$  aryl, or  $C_{7-15}$  aralkyl.

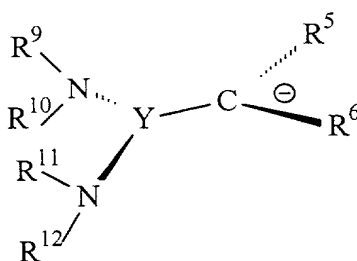
4. The ligand of claim 3 having the formula:



5. The ligand of claim 3 having the formula:



6. The ligand of claim 2 having the formula:

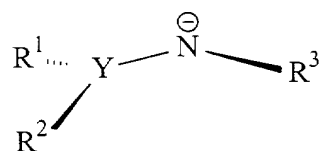


where

$R^9$ ,  $R^{10}$ ,  $R^{11}$ , and  $R^{12}$  are independently  $C_{1-8}$  alkyl,  $C_{6-10}$  aryl, or  $C_{7-15}$  aralkyl.

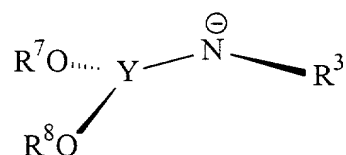
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7. The ligand of claim 1 having the formula:



1

8. The ligand of claim 7 having the formula:



2

where

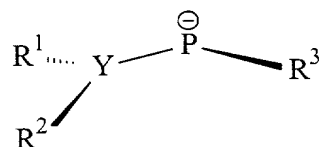
3

$\text{R}^7$  and  $\text{R}^8$  are independently  $\text{C}_{1-8}$  alkyl,  $\text{C}_{6-10}$  aryl, or  $\text{C}_{7-15}$  aralkyl.

4

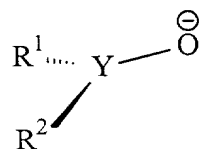
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9. The ligand of claim 1 having the formula:

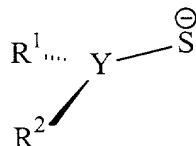


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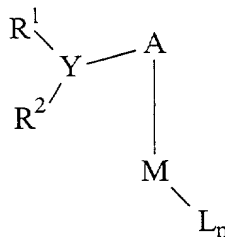
10. The ligand of claim 1 having the formula:



11. The ligand of claim 1 having the formula:



12. A polymerization catalyst containing a ligand of claim 1, and having the formula:



where

M is a transition metal;

L is a sigma bonded or pi bonded ligand;

n is an integer such that the valency of M is satisfied;

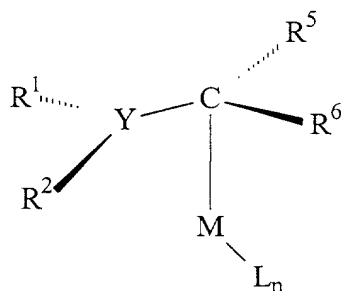
A is CH<sub>2</sub>, CHR<sup>3</sup>, CR<sup>3</sup>R<sup>4</sup>, NR<sup>3</sup>, O, S, and PR<sup>3</sup>;

R<sup>1</sup> and R<sup>2</sup> are independently hydrogen, aryl, C<sub>6-15</sub> diarylphospho, C<sub>1-18</sub> alkylthio, C<sub>6-15</sub> arylthio, C<sub>7-15</sub> aralkyl, C<sub>1-10</sub> alkoxy, C<sub>6-14</sub> aryloxy, C<sub>1-10</sub> dialkylamino, or C<sub>6-15</sub> diarylamino;

R<sup>3</sup> and R<sup>4</sup> are independently hydrogen, C<sub>1-8</sub> alkyl, C<sub>6-10</sub> aryl, C<sub>7-15</sub> aralkyl, C<sub>1-10</sub> alkoxy, C<sub>6-14</sub> aryloxy, C<sub>1-10</sub> dialkylamino, or C<sub>6-15</sub> diarylamino; and

Y is B, Al, or Ga.

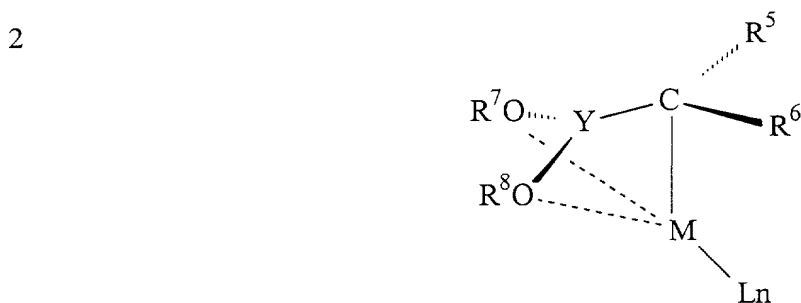
- 1                    13.    The polymerization catalyst of claim 12 having the formula:



2                    where:

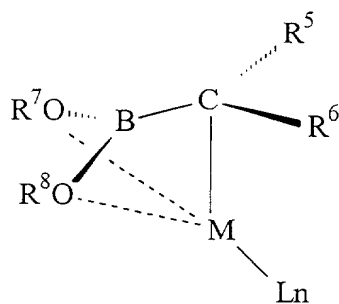
3                    R<sup>5</sup> and R<sup>6</sup> are independently hydrogen, a C<sub>1-8</sub> alkyl group,  
 4                    C<sub>6-10</sub> aryl group, C<sub>7-15</sub> aralkyl group, C<sub>1-10</sub> alkoxy group, C<sub>6-14</sub>  
 5                    aryloxy group, C<sub>1-10</sub> dialkylamino group, or C<sub>6-15</sub> diarylamino  
 6                    group.

- 1                    14.    The polymerization catalyst of claim 12 having the formula:



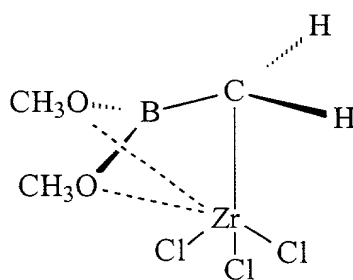
3                    where R<sup>7</sup> and R<sup>8</sup> is hydrogen, a C<sub>1-8</sub> alkyl group, C<sub>6-10</sub> aryl group,  
 4                    or C<sub>7-15</sub> aralkyl group.

- 1                    15.    The catalyst of claim 12 having the formula:



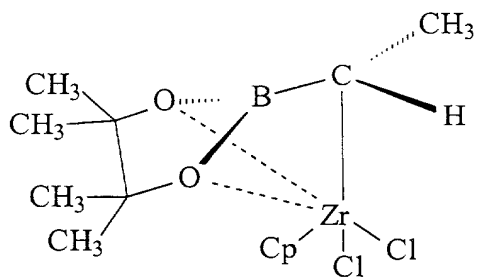
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16. The catalyst of claim 12 having the formula:



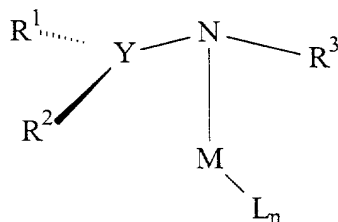
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17. The catalyst of claim 12 having the structure:



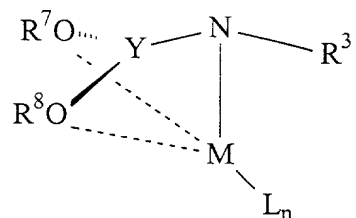
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18. The catalyst of claim 12 having the formula:



1

19. The catalyst of claim 12 having the formula:



2

where

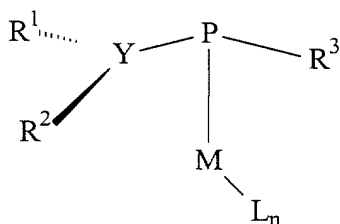
3

$\text{R}^7$  and  $\text{R}^8$  are independently a  $\text{C}_{1-8}$  alkyl group,  $\text{C}_{6-10}$  aryl group, or  $\text{C}_{7-15}$  aralkyl group.

4

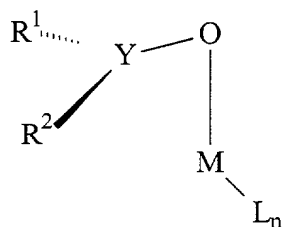
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20. The catalyst of claim 12 having the formula:

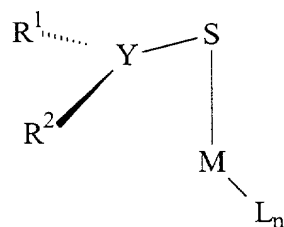


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21. The catalyst of claim 12 having the formula:



- 1                      22.      The catalyst of claim 12 having the formula:



- 1                      23.      A process for the oligomerization or polymerization of at least  
 2      one  $\alpha$ -olefin, said process comprising polymerizing said at least one  $\alpha$ -olefin in the  
 3      presence of a polymerization catalyst component comprising the polymerization  
 4      catalyst of claim 12.

- 1                      24.      A polyolefin or oligoolefin prepared by the process of claim  
 2      23.